334 Sheffield Road, Birdwell, Barnsley S70 5TU

Air Quality Assessment

On Behalf of Gates Homes
July 2026

Greenavon Ltd
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Document Control Sheet

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Quality Management

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Disclaimer

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1 Introduction

1.1 Greenavon Ltd was commissioned by Gates Homes to undertake an Air Quality Assessment to support a planning application to Barnsley Metropolitan Borough Council (BMBC) for a proposed 10-dwelling residential development at 334 Sheffield Road, Birdwell, Barnsley S70 5TU (the Site). A Site Location Plan is included in Figure 1.1, below.

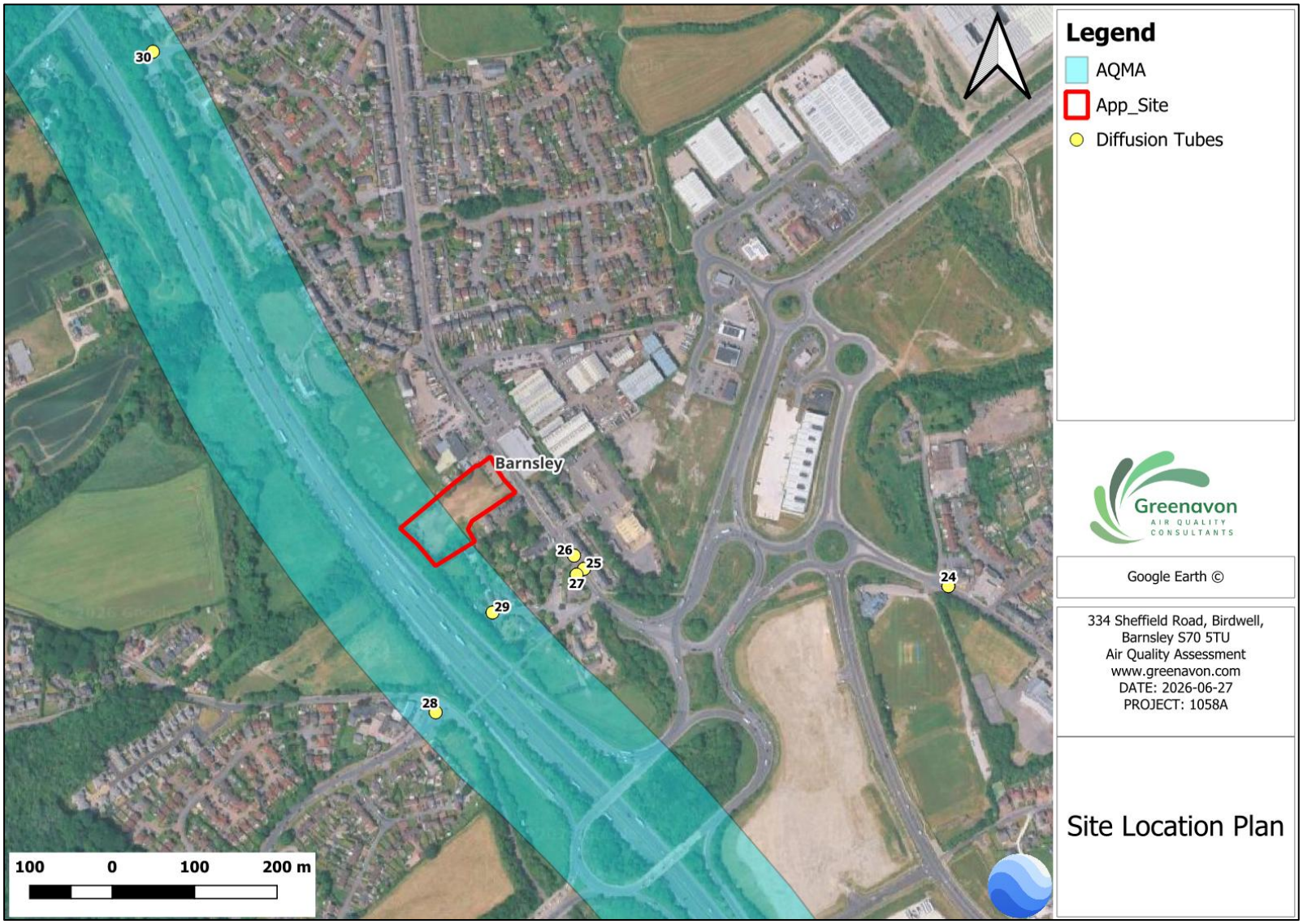
1.2 The Site is in an area of mixed land-use, with commercial premises and highly sensitive residential dwellings found in proximity. Roughly half the Site also lies within BMBC's Air Quality Management Area (AQMA) No.1, which encompasses an area 100m either side of the M1 between Junction 35a and Junction 38. This AQMA is declared for historic exceedances of the annual mean Air Quality Standard (AQS) for nitrogen dioxide (NO_2).

1.3 This Air Quality Assessment evaluates whether the proposed development would:

- expose future occupants to unacceptable air quality.
- lead to significant off-site impacts during construction or operation.
- Require mitigation measures to offset a significant effect or minimise emissions.

1.4 The assessment has been prepared in accordance with best practice guidance from the Department for Environment Food and Rural Affairs (Defra), BMBC, Environmental Protection UK (EPUK) & the Institute of Air Quality Management (IAQM). It evaluates the proposed development's compliance with relevant local and national policies, and legislation.

Figure 1:1: Site Location Plan



2 Policy Context

Air Quality Standards Regulations

2.1 The Air Quality Standards (AQS) Regulations 2010[1] and subsequent amendments, regulate the concentrations of major pollutants in outdoor air in the UK, including particulate matter (PM_{10} & $PM_{2.5}$), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), ozone (O_3), carbon monoxide (CO) and lead (Pb). These regulations seek to minimise the public's exposure to air pollution by requiring ambient concentrations to be within legally binding limit values, as well as target values.

2.2 The AQSs of relevance to this assessment are summarised in Table 2.1 below.

Table 2.1: Air Quality Standards for England

Pollutant	Averaging Period	Objective (µg/m^3)	Date to be achieved by
Nitrogen dioxide (NO_2)	1-hour mean not to be exceeded more than 18 times per year.	200	31 December 2005
	Annual mean	40	31 December 2005
Particulate Matter (PM_{10})	24-Hour Mean not to be exceeded more than 35 times per year	50	31 December 2004
	Annual mean	40	31 December 2004
Particulate Matter ($PM_{2.5}$)	Annual mean	20	1 January 2020

Air Quality Strategy and Environment Improvement Plan

2.3 The Environment Act 1995 requires the Government and devolved administrations to produce a National Air Quality Strategy (NAQS) for the UK. This strategy sets out the framework for improving ambient air quality across the UK. The last major update was published in 2007, with further updates issued in 2011.

2.4 Under the Environment Act 2021[2], the Secretary of State is required to review the NAQS every five years. The first review under the 2021 Act was completed in 2023, and accompanying secondary legislation introduced new statutory air quality targets

[1] Air Quality Standards Regulations 2010 (as amended), S.I. 2010/1001
[2] *Environment* Act 2021 SI No. 1274 (C. 72).

for $PM_{2.5}$ in England. The long-term statutory target is that the annual mean concentration of $PM_{2.5}$ must not exceed 10 µg/m³ by 2040. The *Environment Improvement Plan for England*[3] also sets an ambition to achieve 10 µg/m³ at as many monitoring locations as possible by 2030; however, this is a policy target and not a legal requirement.

2.5 The National Government is responsible for meeting the statutory $PM_{2.5}$ targets, which aim to improve air quality and protect public health. According to Interim Defra guidance[4], these targets are not intended to be applied in the same way as air quality limit values within the planning process. The updated approach shifts away from solely assessing whether a development may exceed a legal threshold (i.e. a limit value). Instead, it emphasises that, wherever reasonably practicable, mitigation measures should be incorporated into design to minimise emissions of, and exposure to, $PM_{2.5}$.

Local Air Quality Management Regime

2.6 Part IV of the Environment Act 1995 and Part II of the Environment (Northern Ireland) Order 2002 sets out that it is the responsibility of every local authority to review air quality within its area and designate AQMAs where air quality limit values are not being achieved. An Air Quality Action Plan (AQAP) setting out the measures to reduce pollution in that area must then be put in place.

2.7 BMBC has adopted an AQAP[5] which provides guidance to developers on suitable mitigation to offset the air quality impact of future development.

National Planning Policy Framework

2.8 The revised National Planning Policy Framework (NPPF)[6], updated in December 2024, sets out the Government's planning policies for England and how these are expected to be applied. A key aim of the NPPF is to promote sustainable development and regarding conserving the natural environment, paragraph 187 states:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by: […]*

[3] Department for Environment, Food & Rural Affairs (2025). Environmental Improvement Plan 2025. Available at: GOV.UK (Accessed: 06 December 2025).
[4] Department for Environment, Food & Rural Affairs (DEFRA), 2025. $PM_{2.5}$ Targets and Planning. Available at: https://uk-air.defra.gov.uk/pm25targets/planning [Accessed 2 May 2025].
[5] BMBC (2025) Barnsley Council Air Quality Action Plan 2025
[6] Ministry of Housing, Communities & Local Government (2024) National Planning Policy Framework

e) *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans".*

2.9 Paragraph 199 relates to compliance with legal limit values and how planning decisions should be consistent with local air quality policy and action plans. It states:

> *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan".*

2.10 Paragraph 198 relates to the appropriate siting of development and the assessment of cumulative effects, it states:

> *"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."*

2.11 Whilst principally relating to sustainable transport, Paragraph 110 is indirectly related to air quality and states:

> *"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce*

congestion and emissions and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making."

Local Planning Policy

2.12 The BMBC Local Plan[7] is used by the Council to help determine planning applications in the borough. It contains policies of relevance to this assessment and air quality, including:

- Policy Poll1 Pollution Control and Protection:

  "Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air, surface water and groundwater, noise, smell, dust, vibration, light or other pollution which would unacceptably affect or cause a nuisance to the natural and built environment or to people. We will not allow development of new housing or other environmentally sensitive development where existing air pollution, noise, smell, dust, vibration, light or other pollution levels are unacceptable and there is no reasonable prospect that these can be mitigated against. Developers will be expected to minimise the effects of any possible pollution and provide mitigation measures where appropriate."

- Policy AQ1 Development in Air Quality Management Areas:

  Development which impacts on areas sensitive to air pollution(13)in air quality management areas will be expected to demonstrate that it will not have a harmful effect on the health or living conditions of any future users of the development in terms of air quality (including residents, employees, visitors and customers), taking into account any suitable and proportionate mitigation required for the development. We will only allow residential development which impacts on areas sensitive to air pollution, where the developer provides an assessment that shows living conditions will be acceptable for future residents, subject to any required mitigation. We will only allow development which impacts on areas sensitive to air pollution which could cause more air pollution, where the developer provides an assessment that

[7] BMBC (2019) Local Plan: Available at: https://www.barnsley.gov.uk/LocalPlan [Accessed 25/06/2026]

shows there will not be a significantly harmful effect on air quality, subject to any required mitigation. Furthermore, development which impacts on areas sensitive to air pollution due to traffic emissions will be expected to demonstrate suitable and proportionate mitigation relative to the increased traffic emissions generated by the development."

Air Quality Guidance

2.13 This assessment has been undertaken with reference to the following regional and national guidance documents:

- Defra *Local Air Quality Management Technical Guidance* (LAQM.TG (2022))[8];
- IAQM and EPUK (2017), *Land-Use Planning and Development Control: Planning for Air Quality*[9];
- IAQM, *Guidance on the Assessment of Dust from Demolition and Construction* (2024) [10;]
- IAQM, *A guide to the assessment of air quality impacts on designated nature conservation sites* (2020)[11]; and
- BMBC, *Barnsley MBC Air Quality and Emissions Good Practice Planning Guidance* (2021) [12].

[8] Defra. 2022. Part IV of the Environment Act 1995, Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management, Technical Guidance LAQM. TG(22).
[9] EPUK & IAQM. (2017). *Land-Use Planning & Development Control: Planning for Air Quality.*
[10] IAQM. (2024). Guidance on the assessment of dust from demolition and construction.
[11] EPUK & IAQM. (2020). A guide to the assessment of air quality impacts on designated nature conservation sites.
[12] BMBC (2021) Barnsley MBC Air Quality and Emissions Good Practice Planning Guidance.

3 Methodology

Baseline Conditions

3.1 The purpose of a baseline assessment is to gather information on existing air quality to better understand how air quality might constrain, or be impacted by, a proposal.

3.2 A review of baseline conditions has been undertaken using data provided by DEFRA's UK AIR information resource[13] and annual status reports from BMBC[14].

3.3 DEFRA's Pollutant Release and Transfer Register[15] was also reviewed to identify any major industrial or waste management sources in the vicinity.

Construction

3.4 The construction phase of the proposed development will result in emissions of dust, fine particulates and other pollutants associated with construction traffic and non-road mobile machinery (NRMM).

Construction Phase Dust Risk Assessment

3.5 There are many activities on a construction site that can generate dust emissions including demolition, cutting, the storage of friable materials, piling, concrete batching, crushing, and screening of wastes, loading and tipping and dry sweeping, amongst others.

3.6 IAQM guidance recommends that an assessment of construction dust risk would likely be required where there is:

> *"a 'human receptor' within:*
>
> *250 m of the boundary of the site; or 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).*
>
> *an 'ecological receptor' within:*
>
> *50 m of the boundary of the site; or 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s)."*

[13] Defra (2024) Background Mapping data for local authorities – 2021 [Accessed online: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021]
[14] BMBC (2025) *Air Quality Annual Status Report for 2024*
[15] Defra. *UK Pollutant Release and Transfer Register (PRTR) data sets*. [Accessed online: https://prtr.defra.gov.uk/pollutant-releases]

3.7 As the proposed development is in proximity to other sensitive uses, a construction dust risk assessment has been undertaken.

3.8 A review of the Multi Agency Geographic Information for the Countryside (MAGIC) website[16] could not identify any statutory ecological receptors near the Site. As such, the potential for significant impacts on ecological receptors can be screened out based on distance alone.

3.9 A construction dust risk assessment involves several steps, which are summarised below:

- **Step 1 (Screening):** distance-based criteria are used to screen the requirement for a detailed dust risk assessment. If sensitive receptors are located within the screening distance, a full risk assessment including steps 2-4 should be undertaken.
- **Step 2:** The dust risk of each phase of the construction works (demolition, earthworks, construction and trackout) is assessed.
    - **Step 2A (Dust Emission Magnitude):** the potential dust emission magnitude for each phase is defined as either 'Small', 'Medium' or 'Large', taking account of the scale and nature of the works.
    - **Step 2B (Sensitivity of Area)**: the sensitivity of the area to dust impacts is identified as either 'Low', 'Medium' or 'High', for each construction phase.
    - **Step 2C (Assignment of Risk)**: The phase magnitude is combined with the phase specific sensitivity to provide a phase risk profile (Low Risk, Medium Risk or High Risk) for dust soiling, human health effects and ecological impacts.
- **Step 3 (Mitigation):** Site specific mitigation for each of the four construction phases is then identified, based on the outputs of Step 2.
- **Step 4 (Judgement of Significance)**: Professional judgment is then used to examine whether any significant residual risk/ effects are likely.

3.10 The above steps are designed to provide a framework for the assessment of construction risk; however, best practice IAQM guidance explicitly states that

[16] Natural England and MAGIC partnership organisations. Multi Agency Geographic Information for the Countryside. http://www.magic.gov.uk/

"professional judgement" should be used when assessing dust risk as the guidance cannot cover the full range of projects likely to be subject to dust assessment.

3.11 IAQM guidance, however, cautions that all judgements must be fully auditable and where justification cannot be given, a precautionary approach should be taken where the highest level of mitigation is recommended.

3.12 The construction dust risk assessment assesses potential effects associated with fine particulate matter (PM) and nuisance dusts. The potential effects relating to the release of heavy metals, asbestos fibres, or other contaminated dusts are not covered by this assessment.

Construction Traffic and Non-Road Mobile Machinery

3.13 LAQM.TG (22) outlines that impacts associated with exhaust emissions from on-site plant (NRMM) are unlikely to have a significant impact on air quality in most cases, provided appropriate controls and site management are in place.

3.14 The number and type of NRMM to be used during construction are not yet known and will be confirmed by the appointed contractor. A Construction Environmental Management Plan (CEMP), or similar document, will likely be required by condition. As such, an assessment of NRMM has been scoped out.

Operational Phase Assessment

Screening Assessment

3.15 Minor developments, on their own, are highly unlikely to cause significant increases in local air pollution concentrations. EPUK & IAQM guidance, therefore, advocates a two-stage screening approach. They state that the impact of a proposal on air quality cannot be screened out, based on size alone, if there are:

- 10 or more residential units or a site area of more than 0.5ha; or
- 1,000 m^2 of floor space for all other uses or a site area greater than 1ha.

3.16 Coupled with any of the following:

- the development has more than 10 parking spaces;
- the development will have a centralised energy facility; or
- other centralised combustion process.

3.17 At the second screening stage, EPUK & IAQM guidance provides indicative criteria which can be used to screen out the potential for significant impacts caused by a proposed development.

Ecological Receptors

3.18 The IAQM advises that, where traffic increases by fewer than 1,000 light-duty vehicles (LDVs) or 200 heavy-duty vehicles (HDVs) per day on roads within 200m of a designated ecological site, the change may, when considered in isolation, be regarded as having an insignificant effect on air quality.

3.19 The proposed development is not located in relevant proximity to any statutory designated conservation site, nor will it result in an increase of more than 1,000 LDVs or 200 HDVs per day on any road. Accordingly, its impact on sensitive designated sites can be screened out.

Sensitivity of Site

3.20 The proposed development introduces residential use to the Site and members of the public would therefore regularly spend significant periods there. As such, all the AQSs for NO_2, PM_{10} and $PM_{2.5}$ apply at the proposed development.

3.21 LAQM.TG (22) and AEA[17] guidance provides details on how pollution concentrations fall with increasing distance from pollution sources, such as roads. These criteria, in combination with the results of the baseline assessment have been used to determine whether an exceedance of any UK AQS is likely across any part of the Site and whether detailed modelling would be required.

3.22 LAQM.TG (22) suggests that where annual mean concentrations of NO_2 and PM_{10} are less than 60 µg/m^3 and 31.9 µg/m^3, respectively, that exceedances of the 1-hour mean AQS for NO_2 or the 24-hour mean AQS for PM_{10} are unlikely.

3.23 DEFRA's *NO_2 Fall Off with Distance Calculator*[18] has also been used to determine the likely concentrations of NO_2 at the Site, based on the results of local monitoring. The calculator estimates the annual mean NO_2 concentration at one distance from a road, using measurements made at a different distance from the same road. The tool was developed by DEFRA as it is not always possible to measure concentrations at exact locations of "relevant exposure".

[17] AEA Energy & Environment (2008) Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance: https://laqm.defra.gov.uk/documents/0802141004_NO2_WG_PracticalGuidance_Issue1a.pdf
[18] DEFRA (2016) NO2 Fall Off with Distance from Roads Calculator v4.2 .[Available online: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/no2-falloff/]

4 Baseline Conditions

4.1 A baseline assessment has been undertaken to provide a summary of the existing air quality environment in the local area.

Local Air Quality Management

4.2 Roughly half the Site also lies within BMBC's Air Quality Management Area (AQMA) No.1, which encompasses an area 100m either side of the M1 between Junction 35a and Junction 38. This AQMA is declared for historic exceedances of the annual mean AQS for NO_2.

Industrial Sources

4.3 A review of the UK Pollutant Release and Transfer Register could not identify any industrial sources that would have the potential to significantly impact air quality in the vicinity of the proposed development. The nearest facility on the register— Greaves Lane Recycling Centre-- is located approximately 2.4 km to the southwest.

DEFRA / UK-AIR

4.4 DEFRA provides predictions of annual mean concentrations of background NO_2, NOx, PM_{10} and $PM_{2.5}$, at $1km^2$ resolution across the UK. A summary of the predictions for the grid square (434500,400500) containing the Site for the years 2021-2028 are set out in Table 4.1 below.

Table 4.1: UK-AIR predicted background concentrations for the Site

Pollutant	Annual Mean Concentration (µg/m³)							
	2021	2022	2023	2024	2025	2026	2027	2028
NO_2	11.9	11.4	11.0	10.4	9.8	9.3	8.8	8.4
NOx	15.7	15.1	14.5	13.6	12.8	12.1	11.4	10.7
PM_{10}	13.2	13.2	13.1	13.1	13.0	12.9	12.9	12.8
$PM_{2.5}$	6.6	6.6	6.5	6.5	6.4	6.3	6.3	6.2

4.5 The data in Table 4.1 show that background annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ are predicted to be below their respective AQS across the Site, between 2021 and 2028.

4.6 Predicted background concentrations of NO_2, PM_{10} and $PM_{2.5}$ are predicted to fall between 2021 and 2028. This is likely due to the gradual improvement of the UK fleet with vehicles with cleaner engines, and other local, regional, and national policies to reduce emissions across all sectors.

Source Apportionment

4.7 The predicted breakdown in background concentrations of NO_X, PM_{10} and $PM_{2.5}$ at the grid square containing the Site are displayed, respectively, in Figures 4.1-4.3.

Figure 4.1: NOx Source Apportionment

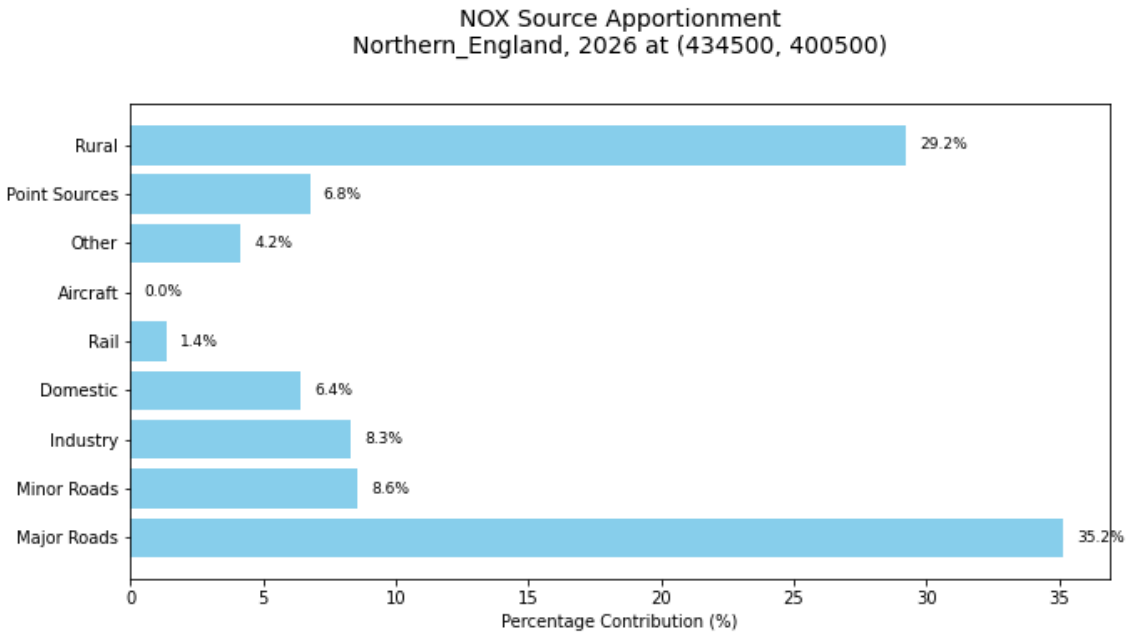


Figure 4.2: PM_{10} Source Apportionment

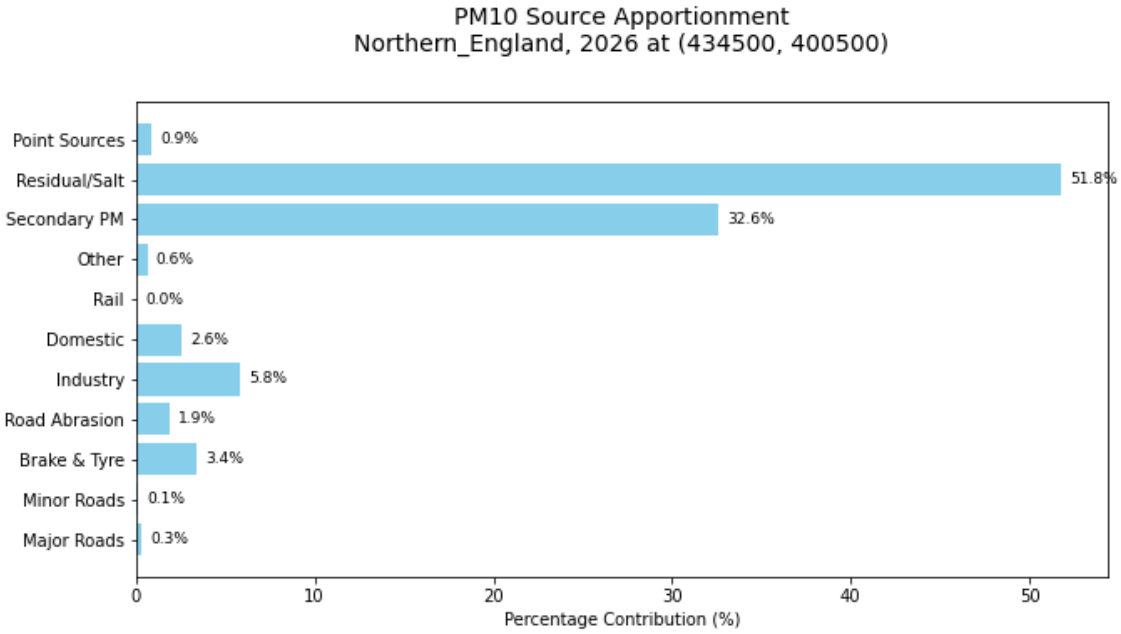
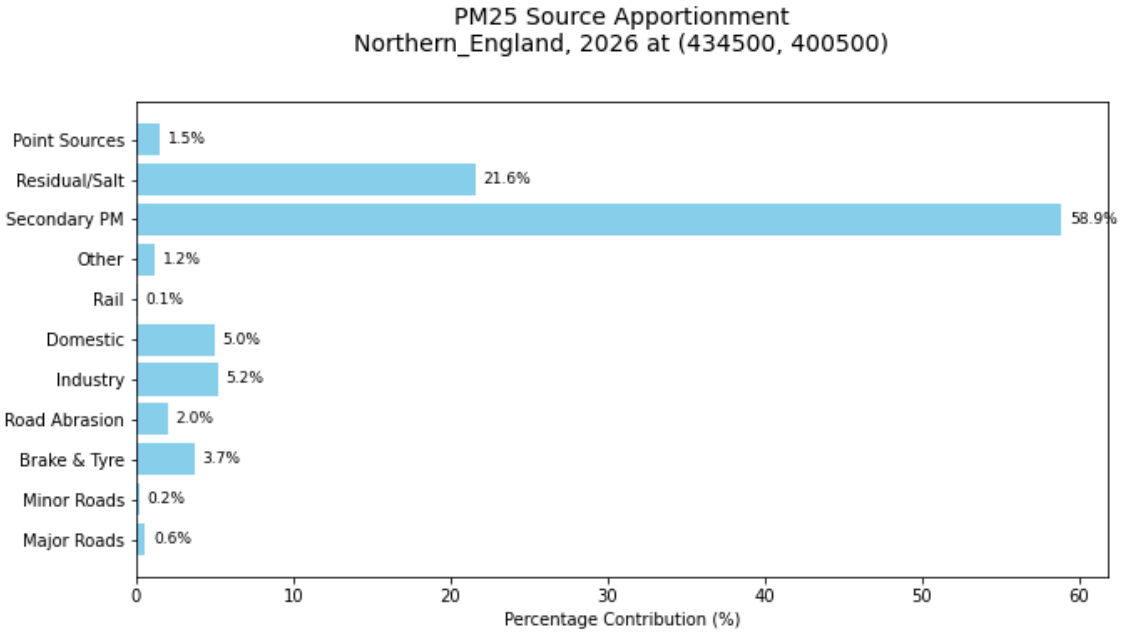


Figure 4.3: $PM_{2.5}$ Source Apportionment



4.8 Figure 4.1 shows that for background NOx—a precursor for NO_2—that major roads (the M1) make up the largest contribution to local background concentrations. The rural background makes up the next most significant contributor.

4.9 Figure 4.2 shows that for background PM_{10}, regional primary emissions and secondary formation make up the most significant contributions.

4.10 Figure 4.3 shows that for background $PM_{2.5}$, secondary particulate matter (PM) makes up the most significant contributing source. Secondary PM forms in the atmosphere from local and regional emissions (for example, nitrates from road traffic and ammonia from agriculture), as well as from transboundary pollution.

Local Authority LAQM Monitoring

4.11 Table 4.2 below summarises the most recently published measurements within relevant proximity to the Site.

Table 4.2: Local Authority Monitoring

Site ID	Site Type	Distance To Site (m)	Distance to Kerb (m)	Annual Mean Concentration (µg/m³)				
				2020	2021	2022	2023	2024
NO_2 (Annual Mean Concentration)								
29	Urban Background	84	0.0	17.8	19.0	20.3	18.7	18.5
26	Roadside	105	1.5	25.7	32.5	29.1	28.8	28.1
25	Roadside	124	1.5	26.0	32.4	27.8	27.3	25.5
27	Roadside	124	0.0	23.9	27.4	27.8	25.1	23.9
28 (old)	Roadside	177	0.0	15.1	16.6	16.1	-	-
24	Kerbside	537	1.0	20.6	24.4	23.1	20.8	19.8
31	Roadside	579	1.7	19.1	21.7	21.5	19.9	18.4
30 (old)	Roadside	637	0.0	20.1	25.0	23.4	-	-
32	Roadside	750	0.0	23.0	24.7	25.9	23.3	-
51	Roadside	782	1.4	-	-	-	19.4	19.9
75	Roadside	782	1.4	-	-	-	19.4	-

4.12 Annual mean NO_2 concentrations recorded at monitors in the vicinity show no clear trend between 2020 and 2024. However, all measured values remained consistently well below the annual mean AQS of 40µg/m³.

4.13 The highest annual mean NO_2 concentration in proximity in 2024 was observed at diffusion tube 26, where levels reached 28.1 µg/m³. This monitor is situated within 1.5m of the kerb of Sheffield Road and approximately 100m from the Site boundary. It is therefore considered broadly representative of roadside conditions at the Site.

4.14 The closest monitor to the Site is diffusion tube 29, which is located at a similar distance from the M1 as the Site boundary. Annual mean NO_2 concentrations at this

location have remained consistent between 2020 and 2024. In 2024, annual mean concentrations were more than 50% below the AQS of 40µg/m^{3}..

5 Construction Dust Risk Assessment

5.1 There are many activities on a construction site that can generate dust emissions including demolition, cutting, the storage of friable materials, piling, concrete batching, the crushing and screening of wastes, loading and tipping and dry sweeping, amongst others. The time of year in which these activities occur can also influence the dust emission magnitude, with drier conditions often favouring dust release.

Dust Magnitude (Step 2A)

5.2 The dust emission magnitude for demolition, earthworks, construction and trackout were categorized ('Small', 'Medium', or 'Large') using professional judgment in combination with the proposed plans. Table 5.1 below sets out the IAQM's dust emission magnitude criteria, as well as the defined project level magnitude for each phase.

Table 5.1: Dust Emission Magnitude

Activity	Dust Emission Magnitude	IAQM Example Dust Emission Magnitude Criteria	Project Specific Dust Emission Magnitude
Demolition	Large	Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level.	**Small:** There are no buildings on-site and the demolition phase would be limited to the clearance/ breakup of the existing car park.
	Medium	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12 m above ground level.	
	Small	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months.	
Earthworks	Large	Total site area >110,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height.	**Small**: The Site area is far less than 18,000 m^2 and no major landscaping works are proposed.
	Medium	Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10	

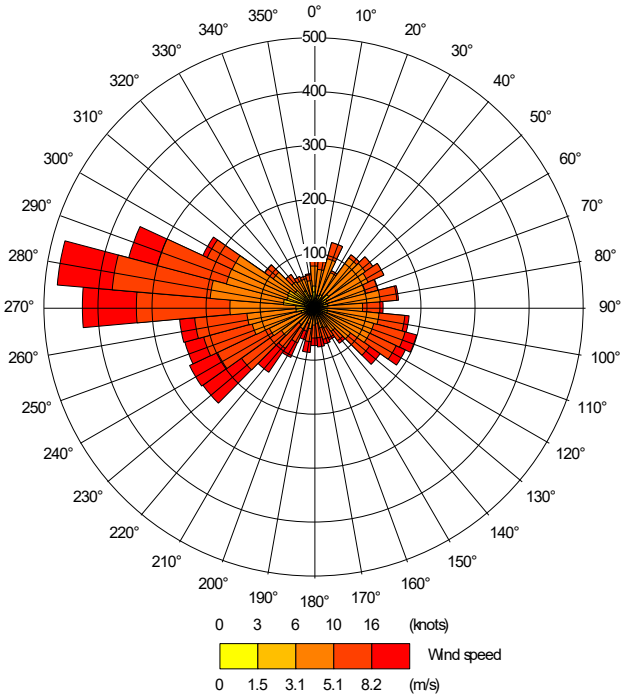
		heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height.	
	Small	Total site area <18,000 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height.	
Construction	Large	Total building volume >75,000 m^3, on site concrete batching, sandblasting.	**Small**: The total volume of proposed buildings is below 12,000 m^3.
	Medium	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching.	
	Small	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).	
Trackout	Large	>50 Heavy Duty Vehicle (HDV) (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m;	**Small:** the Site is small and it is assumed that there would be fewer than 20 outward HDV movements in any one day.
	Medium	20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m	
	Small	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m	

Sensitivity of the Area (Step 2B)

5.3 The sensitivity of the area to dust soiling, human health impacts and ecological impacts is a function of the inherent sensitivity of individual receptors, the local background concentrations of PM_{10}, as well as site specific factors such as the prevailing wind.

5.4 Figure 5.1 displays the wind rose for Emley Moor for 2025. It shows that, during this period, the prevailing wind was from the west. There are highly sensitive receptors downwind of the west, and within 20m.

Figure 5.1: Wind-Rose for Emley Moor (2025)



5.5 High sensitivity receptors include residential dwellings, schools, hospitals and other places where vulnerable members of the community may spend significant periods of time (e.g. care homes and nurseries). However, places such as car showrooms and museums may also be considered of high sensitivity due to the potential for dusts to diminish the value of the property or to significantly impact the enjoyment of a space. Medium sensitivity receptors include areas where people would not reasonably be expected to be present for extended periods of time (e.g., places of work or parks).

5.6 The approximate number of high sensitivity receptors located within 100m of the Site boundary, main demolition works (the car park), and routes potentially used by construction vehicles is set out in Table 5.2 and displayed in Figure 5.2.

Table 5.2: Highly Sensitive Receptors in proximity to the Site

Distance	Distance from (m)			Details
	Site Boundary	Construction Roads	Main Demolition orks	
<20m	10-100	10-100	10-100	Residential dwellings on Stafford Grove and Sheffield Road, Calm Babies (Kindergarten)
<50m	10-100	100+	10-100	As above, plus residential dwellings in wider area + Chatterbox Day Nursery

<100m	10-100	-	10-100	As above, plus residential dwellings in wider area, including Moor Lane

5.7 The sensitivity of the area to earthworks, construction and trackout, for dust soiling, human health impacts and ecological impacts is set out in Table 5.3 below.

Table 5.3: Sensitivity of the Area to Dust

Impact	Sensitivity				Justification
	Demolition	Earthworks	Construction	Trackout	
Dust Soiling	High	High	High	High	There are more than 10 highly sensitive receptors within 20m of the Site boundary/ construction routes
Human Health Impacts	Low	Low	Low	Low	Background concentrations of PM_{10} in the vicinity are below 24 µg/m^3 and there are fewer than 100 receptors within 20m of the site boundary/ Site entrance.
Ecological Impacts	Negligible	Negligible	Negligible	Negligible	There are no statutory ecological receptors within 50m of the site boundary, or within 50m of roads used by construction vehicles within 250m of the Site entrance.

Risk (Step2C)

5.8 The risk of dust impacts during each phase of construction, in the absence of mitigation, is summarised in Table 5.4 below.

Table 5.4: Summary of Dust Impact Risk by Construction Stage

Stage	Dust Impact Risk		
	Dust Soiling	Human Health	Ecological
Demolition	Medium	Negligible	Negligible
Earthworks	Low	Negligible	Negligible
Construction	Low	Negligible	Negligible
Trackout	Low	Negligible	Negligible

5.9 The construction phase of the proposed development is therefore considered to present an overall *medium* risk of nuisance dust soiling effects, and a *negligible* risk of PM_{10} health effects and ecological impacts, in the absence of mitigation.

Site Specific Mitigation

5.10 Table 5.5 below includes the IAQM's highly recommended mitigation measures for sites with an overall *medium risk* of dust impacts, as well as the phase specific mitigation measures for demolition, construction, earthworks and trackout.

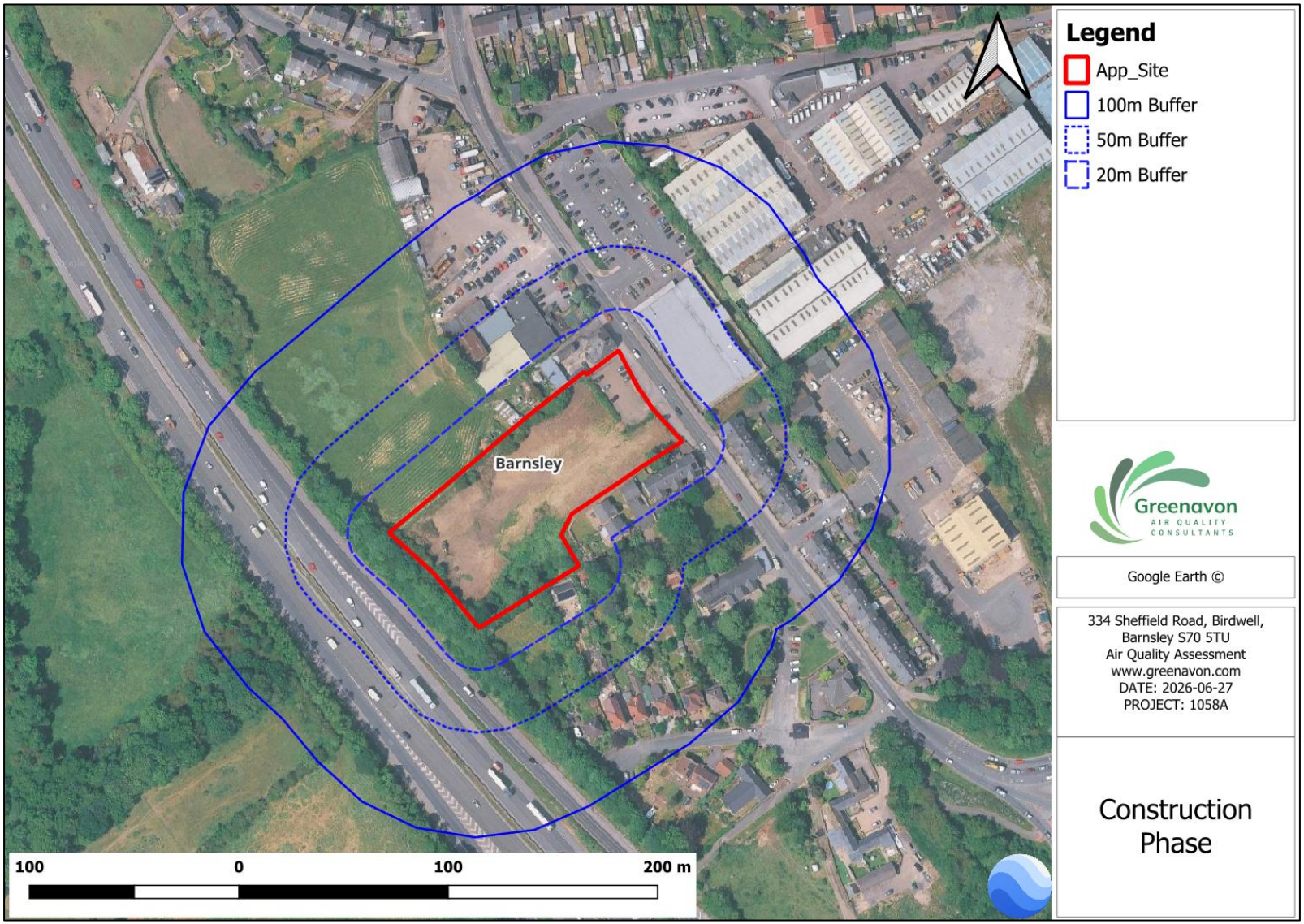
Table 5:5: Highly Recommended Mitigation Measures

Category	Mitigation Measures
General	Develop and implement a stakeholder communication plan that includes community engagement before work commences on site.
	Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary.
	Display the head or regional office contact information.
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make a complaints log available to the local authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.
Monitoring	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Preparing and maintaining the site	Plan site layout: machinery and dust causing activities should be located away from receptors.

	Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site
	Fully enclosure site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on site cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	Ensure all on-road vehicles comply with the requirements of the local authority, in terms of emissions.
	Ensure all vehicles switch off engines when stationary – no idling vehicles.
	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where possible
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems
	Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible).
	Use enclosed chutes, conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	Reuse and recycle waste to reduce dust from waste materials
	Avoid bonfires and burning of waste materials.
Demolition	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.
	Bag and remove any biological debris or damp down such material before demolition

5.11 After the implementation of the relevant mitigation measures listed in Table 5.5, emissions of dust and other fine particulates will be reduced and the residual effect of the construction phase is expected to be *negligible*, which is not significant.

Figure 5.2: Construction Phase Receptors



6 Operational Phase Assessment

Impact Assessment

6.1 Table 6.1 includes EPUK & IAQM indicative criteria for assessing a proposals impact on air quality. Where these criteria are exceeded, further detailed assessment might be required.

Table 6.1: Indicative Screening Criteria

Indicative Criteria to proceed to AQA	Proposal
A change of light duty vehicle (LDV) flows of: - more than 100 average annual daily traffic (AADT) within or adjacent to an AQMA; and - more than 500 AADT elsewhere.	The proposed development comprises 10 dwellings and is not directly connected to the AQMA by the site entrance. As such, it is considered highly unlikely that it would generate sufficient traffic flows to exceed the EPUK/ IAQM screening criteria at any location.
A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA; and - more than 100 AADT elsewhere	
Where a change in road alignment is 5m or more and the road is within an AQMA.	The proposed development would not cause any existing road layout to change by more than 5m.
The introduction of a new junction which causes traffic to significantly change in terms of acceleration/ deceleration, e.g., traffic lights, or roundabouts.	No major offsite junction improvements are planned.
Typically, any combustion plant where the single or combined NO_X emission rate is less than 5 $mg.s^{-1}$ is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion.	The proposed heating strategy is all-electric, using air source heat pumps (ASHP).

6.2 As none of the criteria in Table 6.1 were exceeded, it can be concluded that the proposed development would have no significant effect on local air quality.

Sensitivity

6.3 AEA and LAQM.TG (22) guidance provide the following criteria to determine the site type, for the purposes of classifying monitoring locations. By combining the site type definition (e.g., background, roadside, urban background), reproduced in Table 6.2 below, with data provided in the baseline assessment, a judgement can be made on the likelihood of exceeding the relevant AQSs at the Site.

Table 6.2 Site Type Classification

Guidance	Definition of Site	Description
LAQM.TG (22)	Roadside	A site sampling typically within one to five metres of the kerb of a busy road (although distance can be up to 15 m from the kerb in some cases)
	Background	An urban location distanced from sources and therefore broadly representative of citywide background conditions, e.g., urban residential area
AEA Diffusion Tube	Roadside/ Kerbside	Kerbside sites should be within 1 m of the kerb and are usually fixed to street furniture. Roadside diffusion tubes should be sited between 1 and 5 m from the kerb edge and mounted ideally either on a lamp post or road sign on the pavement, or on the face of a building adjoining the pavement.
	Background	Urban background sites must be located: • >50 m from any major source of NO_2, such as multi-storey car parks. • >30 m from any very busy road (> 30,000 vehicles per day). • >20 m from a busy road (10,000 – 30,000 vehicles per day) or from any medium sized sources, e.g., petrol stations or ventilation outlets from catering establishments. • >10 m from any main road. (Quiet roads, for example within residential estates, are acceptable); and • >5 m from anywhere where vehicles may stop with their engines idling.

6.4 The proposed dwellings nearest the M1 are located over 80m set back from the free-flowing carriage of the motorway, whilst the nearest dwellings on Sheffield Road are less than 10m from the kerb. 24-hour AADT counts for these roads were as follows in 2025:

- M1[19]: 107,026
- Sheffield Road[20]: 16,652

6.5 Accordingly, areas of the Site situated beyond approximately 20 m from Sheffield Road can be regarded as forming part of an urban background environment. There are no dwellings within 5m of Sheffield Road and as such, there are no dwellings that would be classified as true roadside locations.

6.6 As shown in Table 4.1 and Table 4.2, background concentrations of NO_2, PM_{10} and $PM_{2.5}$ are predicted to be well below the relevant AQSs across the Site and wider area (including indicative thresholds for potential exceedances of the 1-hour mean NO_2 and

[19] DFT (2026) Road Traffic Statistics – Count points 26006. Available at: https://roadtraffic.dft.gov.uk/count-points/26006
[20] DFT (2026) Road Traffic Statistics – Count points 46618. Available at: https://roadtraffic.dft.gov.uk/count-points/46618

24-hour mean PM_{10} objectives). There have been no measured roadside exceedances of the annual mean AQS within 800m of the Site, including locations adjacent to Sheffield Road since at least 2020. This suggests that pollution levels across the Site would be below the relevant AQSs.

NO_2 Fall Off With Distance Calculation

6.7 Table 6.3 shows the predicted concentration at the nearest dwelling to Sheffield Road. based on the 2024 measurements of other nearby monitors on Sheffield Road.

Table 6:3: Predicted Annual Mean NO_2 (2024)

Diffusion Tube	Distance (m)		NO_2 Annual Mean Concentration (µg/m³)		
	Monitoring site to kerb (m)	Application site to kerb (m)	Background (UKAIR)	Monitored at tube	Predicted
25	1.5	7.3	10.4	25.5	20.3
26	1.5	7.3	10.4	28.1	22.0
27	0.1	7.3	10.4	23.9	15.9
31	1.7	7.3	10.4	18.4	15.8

6.8 DEFRA's *NO_2 Fall Off With Distance Calculator* predicts that annual mean concentrations of NO_2 would have been at least 45% below the annual mean 40µg/m³ AQS at the nearest part of the proposed development to Sheffield Road, in 2024. All predicted concentrations are also well below the indicative threshold for likely exceedances of the short-term AQS for NO_2 (60µg/m³).

6.9 Considering the above, it is considered highly likely that concentrations of NO_2 are, and will continue to be, below their annual mean and hourly AQSs at the Site. As road traffic is the principal source of air pollution in the local area, it is also considered highly likely that concentrations of PM_{10} and $PM_{2.5}$ are also below their respective AQSs.

Mitigation

6.10 Annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ across the proposed development are predicted to be below their relevant AQS_S, and the proposed development will not significantly impact local air quality. As such, there is no requirement for additional mitigation to reduce impacts or exposure, or to offset a significant effect.

6.11 However, the NPPF requires that developments “wherever possible” help to improve local environmental conditions and new Defra guidance requires development to, wherever reasonably practicable, minimise exposure to, and emissions of, $PM_{2.5}$.

6.12 The proposed development would be classified as a Minor development in BMBC’s planning guidance. As such, it will require 1 charging point per unit (dwelling with dedicated parking) or 1 charging point per 10 spaces (unallocated parking).

6.13 The proposed development supports efforts to minimise pollution and exposure through:

- The adoption of an all-electric energy strategy.
- The provision of EV charging points, in line with the Building Regulations and BMBC guidance.
- The provision of secure cycle parking.

7 Discussion

7.1 Local and national air quality policies seek to sustain compliance with national objectives and limit values, and to prevent new development from contributing to, or being put at unacceptable risk, from unacceptable levels of air pollution. Furthermore, a key theme of the NPPF requires development to identify opportunities to improve air quality. BMBC's Local Plan Policy Poll1 similarly requires all new development to minimise emissions.

Construction

7.2 A construction dust risk assessment was undertaken in line with guidance provided by the IAQM. The assessment found that the construction phase of the proposed development presented a medium risk of dust soiling effects to neighbouring uses, and an appropriate level of mitigation was recommended to negate this risk. These recommendations should be incorporated into a Construction Environmental Management Plan (CEMP), Dust Management Plan (DMP), or similar document.

Operational Impacts

7.3 The energy strategy is all electric and the proposed trip generation from the Site will fall well below EPUK & IAQM's screening criteria. The potential for significant operational impacts could therefore be screened out. As such, the proposal will have no significant effect on local air quality during operation.

Compliance and Exposure Assessment

7.4 Although part of the proposed development lies within BMBC's Air Quality Management Area (AQMA) No. 1—which extends 100 m either side of the M1—a review of baseline air quality conditions, drawing on DEFRA/UK-AIR datasets and local monitoring evidence, demonstrates that background concentrations of NO_2, PM_{10} and $PM_{2.5}$ across the Site are below the relevant AQS_S.

7.5 In addition, annual mean concentrations of NO_2 were predicted at the most at risk location in the proposed development using DEFRA's *NO_2 Fall Off With Distance Calculator*. The outputs of this tool indicate that annual mean concentrations of NO_2 at the proposed residential use are, and will continue to be, well below the relevant standards. As such, the Site is deemed suitable for the introduction of residential use, without the need for further air quality mitigation to minimise exposure.

Mitigation

7.6 The proposed development supports wider policies to minimise emissions and reduce exposure as the energy strategy is all electric, it incorporates EV charging points and secure cycle storage.

8 Conclusions

8.1 Greenavon Ltd was commissioned by Gates Homes to undertake an Air Quality Assessment to support a planning application to the Barnsley Metropolitan Borough Council (BMBC) for a proposed 10-dwelling residential development at 334 Sheffield Road, Birdwell, Barnsley S70 5TU.

8.2 The assessment concludes that during the operational phase, the proposed development would have no significant impact on, nor would be significantly impacted by, local air quality.

8.3 The proposed development is judged to include an appropriate level of mitigation to minimise its impact during the operational phase.

8.4 A medium level of dust suppression (e.g. watering down of dusty activities) should be implemented during construction to minimise the risk of significant dust effects on neighbouring uses and support national efforts to minimise $PM_{2.5}$ emissions.

8.5 Providing the recommendations of this report are implemented, the proposed development is judged to be consistent with all local and national planning policies. Air quality should not, therefore, present a material constraint to the planning process.

Greenavon Ltd

Experts in Air Quality and Odour Assessment

Registered Office Address: 128 City Road, London,
United Kingdom, EC1V 2NX

Company Number: 14788658

www.greenavon.com